Value of a placental-specific to total soluble fms-like tyrosine kinase 1 ratio in women with suspected preeclampsia

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Introduction

Soluble fms-like tyrosine kinase 1 (sFlt-1) is a key protein involved in preeclamptic (PET) pathophysiology. It is a soluble anti-angiogenic protein found within the maternal circulation and two main variants have been identified; the placental-specific sFlt-1 e15a, and sFlt-1 i13, which is mainly produced by the endothelium. Elevated sFlt-1 can assist in the prediction and diagnosis of PET. As PET is a heterogeneous disorder with different underlying aetiologies, we sought to determine whether a ratio comparing placental specific sFlt-1 e15a to total sFlt-1 may improve the diagnosis of PET due to a placental cause, such as is more commonly seen in early onset PET (<34 weeks gestation at onset). When the placental source of sFlt-1 is greater than the endothelial source the ratio would be expected to be higher.

Methods

93 women at clinical suspicion of PET consented to provide serum samples. Of these, 30 did not develop PET, 31 had early-onset disease, and 32 had late-onset disease.

Total sFlt-1 was quantified using the B.R.A.H.M.S Kryptor Compact Plus automated immunoassay platform. sFlt-1 e15a was measured using a custom ELISA. Maternal and pregnancy outcome details were collected from medical records.

Results

We saw no statistically significant difference in the ratio of sFlt-1 e15a:total sFlt-1 between those who develop PET compared with those who do not. There was also no statistically significant difference in the ratio between those with early-compared to late-onset PET.

Table 1. *Baseline maternal characteristics; *p<0.05, ** p<0.01, # p<0.001, ^ p<0.0001, preeclampsia (PET), EO (early-onset), LO (late-onset), BP (blood pressure).*

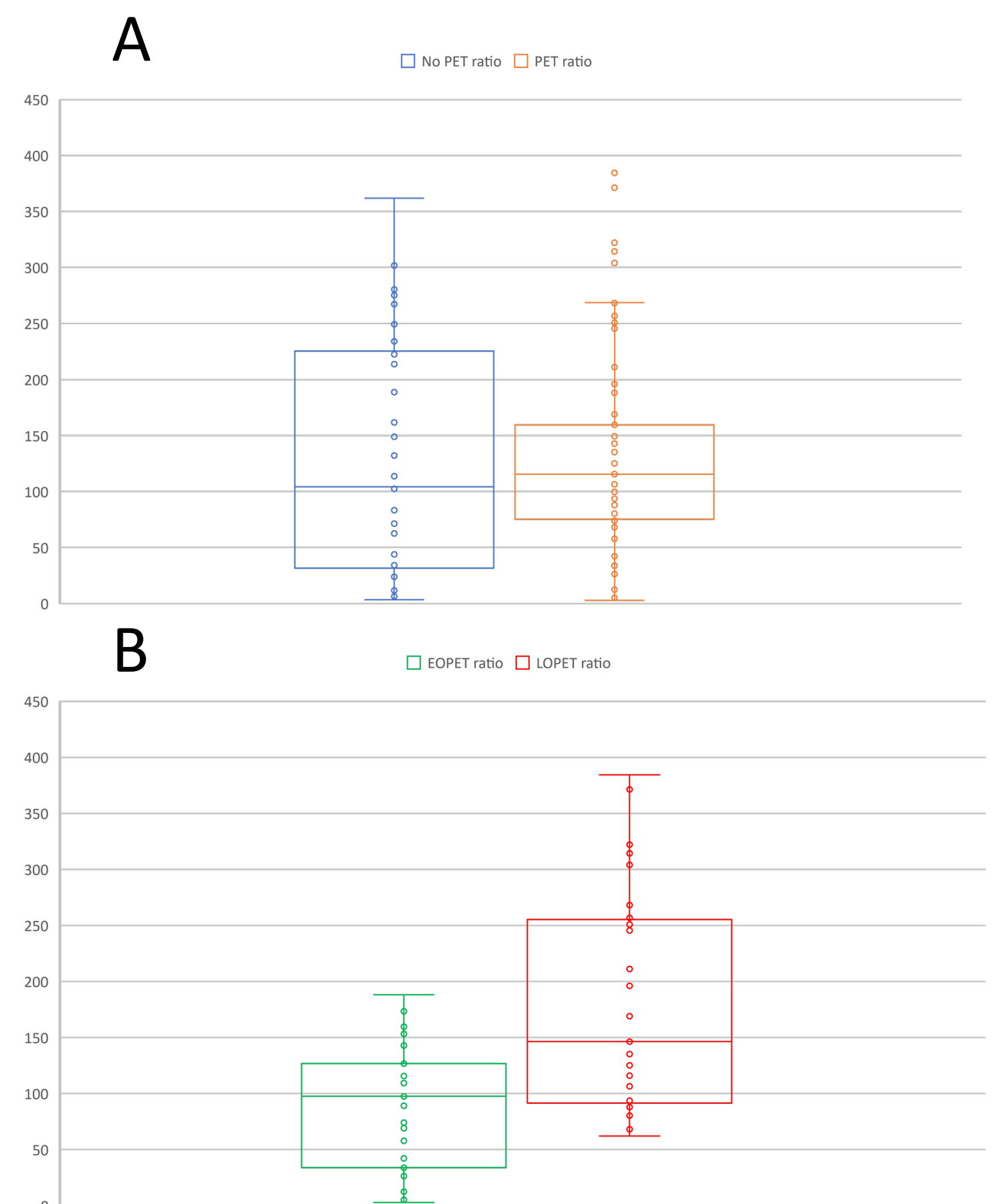|	No PET (n=30)	PET (n=63)	EOPET (n=31)	LOPET (n=32)
Maternal Age – years	29.3± 4.84	32.6 ± 5.44**	33.2 ± 5.7 **	31.9 ±5.2*
BMI – kg/m2	30.8± 10.5	30.8 ± 7.76	30.6 ± 7.3	31.1 ± 8.3
Booking systolic BP – mmHg	117 ±13.5	124 ± 16.0*	127.3 ± 17.3 **	120.5 ± 14.2
Nulliparous	17 (56.6%)	30 (47.6%)	18 (58%)	11 (34%)
Smoker	4 (13.3%)	4 (6.3%)	2 (6.5%)	2 (6%)
GA at delivery – days - weeks	264 ± 23.4 37.5	244 ± 27.2# 34.8	224 ±23.6^ 31.9	264 ± 10.7 37.7
GA at collection - days - weeks	241 ± 30.3 34.3	232 ± 26.7 33.1	236 ± 28.8 33.5	228 ±24.4* 32.4

Figure 1. *sFlt-1 e15a:total sFlt-1 ratio in:* **A**. *no preeclampsia (PET) compared to all preeclampsia,* **B**. *early-onset (EOPET) compared to late-onset preeclampsia (LOPET).*

Conclusion

These results show no benefit to the use of an e15a:total sFlt-1 ratio in women under clinical investigation for PET.

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